Journal of Applied Communications

Volume 105 | Issue 1 Article 7

Navigating Transparent Pork Production: Analyzing Visual Attention of The Maschhoffs Website

Nellie Hill
New Mexico State University

Maggie Elliot
University of Idaho

Courtney Meyers
Texas Tech University

Recommended Citation

Hill, Nellie; Elliot, Maggie; and Meyers, Courtney (2021) "Navigating Transparent Pork Production: Analyzing Visual Attention of The Maschhoffs Website," *Journal of Applied Communications*: Vol. 105: Iss. 1. https://doi.org/10.4148/1051-0834.2352

Navigating Transparent Pork Production: Analyzing Visual Attention of The Maschhoffs Website

Abstract

When it comes to food, consumers are increasingly concerned with the welfare of the livestock used to produce it. To display transparency and build trust with patrons, businesses such as The Maschhoffs, a pork production company, have created online tools to answer questions about production processes. This study implemented eye tracking and survey methodologies to attain insight regarding the visual attention of website visitors. While results revealed no discernable pattern of navigation among respondents, the findings illustrated a sector of the pork industry consumers expressed interest in was the breed-to-wean section of the farm. Researchers encourage agricultural communicators to develop messaging surrounding this specific process to continue building trust with consumer audiences as well as make recommendations for utilizing eye tracking to assess visual attention to websites.

Keywords

eye tracking, trust, transparency, interactive website, visual attention

Cover Page Footnote/Acknowledgements

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2017-70001-25991.

The globalization of food supply chains as well as information have created increasingly large, complex systems of inputs, outputs, processes, platforms, organizations and individuals who ultimately deliver food to the table and shape consumers' opinions about it (Akin & Scheufele, 2017; Ling & Wahab, 2020). Discussions about food systems can broadly be divided between two paradigms: agri-industrial (industrialization, standardization and globalization of supply chains) versus integrated territorial (diversity, de-concentration and reconnection of food to cultural and physical contexts) (Bui et al, 2019; Lamine et al., 2012; Wiskereke, 2009). In practicality, these paradigms coexist in food systems, leading to wide-ranging views on the agriculture industry (Bui et al., 2019). The contrasting paradigms have incited a society increasingly expressive of a fundamental concern with the social, economic, and environmental climate of the world. Among the areas of foremost trepidation to the public is the ethical nature of the food supply (Ficko & Bončina, 2019; Ling & Wahab, 2020).

Not only do eating habits reflect how individuals seek to nourish themselves and loved ones as an essential act in sustaining life, but the nuances and care taken in the preparation of meals can also serve as a remarkable expression of identity and culture (Nardi et al., 2019; Perez-Cueto, 2019). Food represents a broadly universal yet uniquely intimate cornerstone of our lives; yet consumers lack knowledge about the processes that move their food from the farm to their table (Leal et al., 2017). The complex nature of the food system also limits consumers' ability to independently verify the intrinsic nature of food items, such as organic, fair-trade, or ethically raised (Wang et al., 2017). Consumers have asserted elevated apprehension in aspects of the food system, concerned with food safety standards, unheeded additives, the ecological footprint of industry practices, and animal welfare (Auger & Devinney, 2007; Kemper & Ballantine, 2019; Ling & Wahab, 2020).

Most Americans today are two to three generations removed from the farm, a statistic signifying the scarcity of direct experience with agriculture presently observed in our society (Hoppe, 2016). The distance consumers bear from the food industry has initiated complexities in information seeking, consequently spurring questioning of industry practices (Center for Food Integrity, 2018). Nevertheless, Robinson et al. (2020) found moderate trust in the food supply chain, with agricultural production receiving the highest trust rating and food processing receiving the lowest trust rating. In terms of livestock production, "There is an increasing appreciation of animal welfare parameters over other quality attributes, and animal-friendly products are considered healthier, safer, tastier, more hygienic, authentic, environmentally friendly, and traditional by many consumers" (Alonso et al., 2020, p. 7). Conclusions from previous research suggest the growing concern for livestock welfare is intensifying in the hierarchy of societal issues, becoming increasingly salient for consumers (Corallo et al., 2019; Mancini & Antonio, 2020; Napolitano et al., 2010).

To address these concerns among consumers, agricultural organizations have turned to transparency as a communications strategy (Rumble & Irani, 2016). Communicative transparency was quantified and defined by Rawlins (2008) as follows:

> Transparency is the deliberate attempt to make available all legally releasable information – whether positive or negative in nature – in a manner that is accurate, timely, balanced, and unequivocal, for the purpose of enhancing the reasoning ability of publics and holding organizations accountable for their actions, policies, and practices. (p. 75)

Communicative transparency is marked by substantial information, participation, and accountability as perceived by the consumer (Rawlins, 2008). Specific to the food supply chain, transparency is defined as the "degree of shared understanding of and access to product-related information as requested by a supply chain's stakeholders without loss, noise, delay, or distortion (Wogum et al., 2011, p. 65). Trust is one of the most important factors in food production (Astill et al., 2019; Bilyea & McInnes, 2018). Transparent communication has been found to increase trust, favorable attitudes, and connection between consumers and producers (Goodwin, 2013). Means of accomplishing this in agriculture include tours of production processes (Specht et al., 2014), sharing testimonials (Rumble & Irani, 2016), and videos of the animal slaughter process (Tarpley et al., 2020), all of which can be presented via the web by the various segments of the industry.

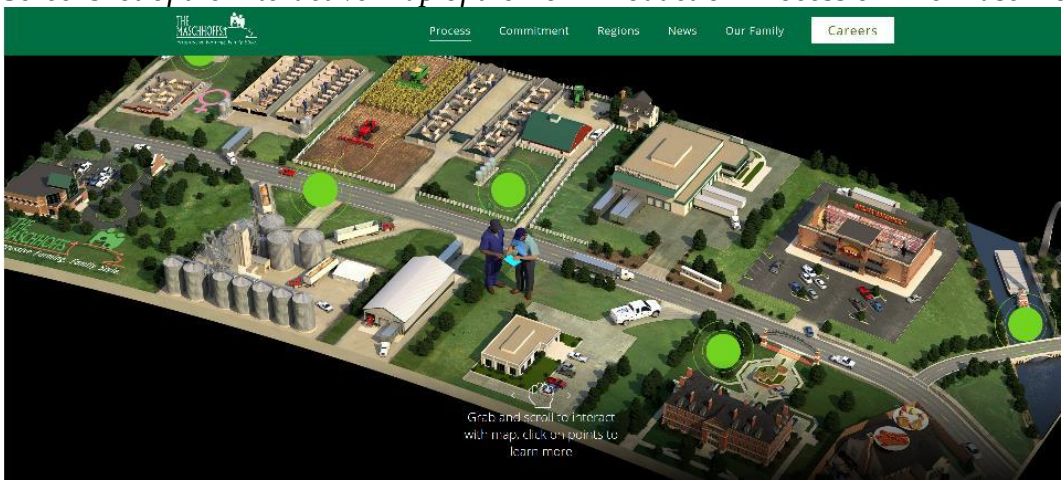
While there are countless online media opportunities to reach consumers, corporate websites remain a consistent platform for animal protein companies to directly reach their consumers (Goodwin, et al., 2011; Kim & Rader, 2010; Morris et al., 2019; Symonenko, 2007). The website offers an opportunity for dissemination of accurate, transparent, and repetitious information regarding animal production and welfare practices (Croney et al, 2012; Morris et al., 2019). More research regarding how best to utilize corporate webpages to increase transparency and public communications is still needed (Croney et al., 2012; Morris et al., 2019).

The pork industry has experienced heightened scrutiny over the past decade, facing a plethora of concerns from abuse of antibiotic treatments, the confinement of gestation stalls and farrowing crates, and practices perceived as both unnecessary and inhumane such as tail cutting (Grunert et al., 2018). In pursuit of alleviating concerns and educating consumers, the pork industry has actively sought ways to increase transparency by detailing the processes of swine production. Although transparency is a term heralded by both commodity organizations and consumer activist groups, a streamlined approach to evoke this concept has yet to be defined (Amos & Sullivan, 2018). While consumer attentiveness to animal welfare is clearly evidenced, little research has been conducted to distill the segments of the pork production chain generating the most unease. Identifying such components may offer timely information regarding message topics most powerfully resonating with consumers.

In pursuit of establishing transparency, one pork company has integrated a detailed map of the swine production farm to fork process into their corporate website (Figure 1).

Figure 1

Screenshot of the Interactive Map of the Pork Production Process on The Maschhoffs Website



The Maschhoffs is family-owned and headquartered in Carlyle, Illinois, yet they have global reach as the fourth largest hog production company in North America (The Maschhoffs, n.d.). Their corporate website includes an interactive map of how they raise five million pigs each year. The Maschhoffs webpage offers an opportunity for researchers to address the need to identify the specific aspects of the pork production process consumers invest time and energy attending to while viewing transparent animal production information directly from a corporate website. This study contributes to the body of knowledge regarding attempts by the industry to increase transparency regarding agricultural practices.

The recognition of the processes of pork production consumers deem most salient will inform communication practitioners as they continue to design websites and online media in an effort to educate consumers. Eye tracking serves as an appropriate measure for this inquiry because of the tool's ability to discern viewers' attention to definite elements of a message via eye movement paths across the stimus (scanpaths) and eye fixation duration on elements of the stimulus (areas of interest) (King et al., 2019). Eye tracking enables researchers to distinguish the pieces of the message the audience visually attends to, exacting a unique precision differentiating it from other forms of measurement (Gong & Cummins, 2016). Stanton and Fischer (2020) summarized eye tracking research in agricultural communications, provided visuals for methods and results, and suggested ideas for applications in research and practice. The capability of eye tracking technology to ascertain the decisive characteristics of an individual's attention renders this method as an auspicious approach to deducing the salient attributes of websites and online content.

Conceptual Framework

Selective attention explains how people process mass amounts of information, explaining "viewer's allocation of attention to specific elements in the visual field to then process" (Fischer, 2017, p. 23). A coping mechanism, selective attention is utilized when people face a great deal of information in their environment, including what they are exposed to on the internet (Cummins et al., 2016). Consumers are constantly bombarded with competing information elements and must decide which elements to give their attention to in order to function in such information-rich environments. Selective attention is a helpful concept for researchers to use for exploring how people allocate attention to rival messages within a given stimulus, such as The Maschhoffs website used in this study (Cummins et al., 2016). The quantitative methodology of eye tracking "permits a more granular assessment of not only attention to a media message or platform over other elements in the environment, but also intrastimulus selective attention to elements within a message" (Cummins, 2017, p. 1).

A combination of message-level and individual-level factors influence any given person's selective attention to information. Automatic and controlled processes are utilized by a person when selectively attending to messages. Previous research has detailed automatic, or bottom-up, processes to be utilized when message elements provoke or guide attention, such as the onset of a new message element or messages presented in sequence (Bucher & Schumacher, 2006; Fox et al., 2004; Lang et al., 2005; Pieters & Wedel, 2004). Researchers have relied on salience theory to explain this involuntary attention, explaining attention is driven by the dominant textual, visual and interactive elements of a message demanding selection and interpretation (Greussing et al., 2020; Itti & Koch, 2000).

Alternatively, individual-level factors have been shown to affect selective attention in a more controlled, top-down, manner. These factors include sensation seeking, salience of an information element, affect regulation, and age (Cummins et al., 2016). Schema theory explains this voluntary attention as individual intention and capabilities drive attention to elements of a message (Anderson & Pearson, 1984; Greussing et al., 2020). Message-level and individual-level factors combine when "people develop sophisticated selection mechanisms to rapidly prioritize aspects of a complex message and guide attention towards specific message elements" (Gong & Cummins, 2016, p. 4).

Selective attention to information elements in a stimulus is an interaction between the viewer's goals and the visual stimulus (Smith et al., 2007). Previous research suggests that automatic, bottom-up responses come first, followed by controlled, top-down responses. Therefore, even if a message provokes initial attention from the viewer, the message must be consistent with the viewer's goal or it will be ignored (Smith et al., 2007). Attention allocation has been associated with visual elements consistent with viewer issue involvement (Fischer, 2017; Klink et al., 2014; MacInnis & Jaworksi, 1989), creating a need to assess agricultural involvement of participants in this study.

Eye-tracking studies applying selective attention to investigate website stimuli are a relatively novel and unexplored avenue of research in agricultural communications (Stanton & Fischer, 2020). The larger field of media research does provide some insights. Ho (2018) investigated participant response to various levels of complexity with regards to interactive features on a website. The researcher found participants tended to give attention to webpage features indicating information important to the participant's motivational goals. Chu et al. (2009) explored viewer attention to news website format, salient elements, and navigation. They found the design in terms of form and layout of each element does make a difference in engaging, informing, and involving the user. Greussing et al. (2020) sought to identify how users selectively attend to static, interactive, and interactive-animated data in online news. They found interactive animation to sustain the longest duration of attention. Yet they urge the overall takeaway from their study is for design choices to be linked to the purpose of the information being communicated (Greussing et al., 2020). Stanton and Fischer (2020) recommended these types of studies be applied to agricultural information to gain insight into how consumers attend to such content.

Purpose and Research Questions

The purpose of this study was to explore visual attention regarding different aspects of The Maschhoffs website. Four research questions guided the study:

RQ 1: What scanpath patterns emerge from participants' initial evaluation of the website?

RQ 2: What areas of interest emerge from participants' website viewing?

RQ 3: Are there differences in visual attention to the website between individuals with high agricultural involvement and low agricultural involvement?

RQ 4: How do participants perceive the trustworthiness of The Maschhoffs organization?

Methods

Participants

This eye tracking study engaged the participation of undergraduate students at a southern university. Lucas (2003) asserted the recruitment of college students for consumer research studies is appropriate when the procedure investigates basic psychological processes. The students were classified as Generation Z consumers, born between 1995-2010 (Pribis et al., 2010). Generation Z members are digital natives known for their ability to rapidly identify information on the internet specific to their individual goals (Rothman, 2014; Seemiller & Grace, 2016) making their use of a corporate website delivering information directly to the consumer a platform of interest for investigation. This generation prefers visuals over text when it comes to learning new information (Rothman, 2014). As Generation Z becomes the prime consumer purchasing demographic of ages 25-54, the generation will influence the structure of the market based upon their preferences (Dimock, 2019). Additionally, previous research has evidenced this generation may be more inclined to consider meat alternative diets due to the perceived adverse environmental impacts of the livestock industry (Mancini & Antonio, 2020).

Participants from this study were recruited through the daily email-based university announcement platform. Those interested in participating emailed the researchers, who then asked the participants to complete a poll regarding their availability, followed by an email assigning individual appointments in the lab with one of the researchers. Participants were compensated $20 cash for their time. A total of 74 participants were recruited for the study. The academic classification of participants consisted of 35% seniors (n = 26), 26% juniors (n = 20), 24% sophomores (n = 17), and 14% freshman (n = 10). Similar studies have utilized between 45 to 96 participants, indicating this sample is adequate to address the research questions of this study (Chung, 2009; Greussing et al., 2020).

Stimulus

This study featured an interactive webpage developed by the pork production company The Maschhoffs as the introduced stimuli. Interactive webpages “allow consumers to change online content in real-time with mouse-based actions such as clicking, dragging, hovering and flipping” (Xu & Sundar, 2016, p. 621). The interactive features of The Maschhoffs webpages meet the qualifications of this definition by giving viewers an opportunity to take such actions within the site.

The study stimulus, designated under the “Process” tab in The Maschhoffs website navigation, explained 15 steps in pork production from farm to table through a graphic, interactive map with supplemental images and text within each step in the process. The webpage featured a birds-eye view of the facilities central to the production process. Viewers could grab and scroll to view different areas of the map and click on a facility to learn about specific processes regarding the precise step in the process. Eight “production” processes and seven “support” functions were available for viewers to learn more about throughout the map. The website identified the eight production processes as: boar stud, gilt developer, breed-to-wean farm, finishing farm, packing facility, grocery store, consumer home, and export and barge. The seven support functions were identified as: headquarters, feed mill, truck wash, resource loop, regional office, production manager/production partner interaction, vet truck, and Maschhoffs

university. Each process or function was represented by graphic imagery regarding the facility where the practices take place. Once selected, the graphic gave way to supplemental information including videos and text explanations of that step in the pork production process.

Measurement

The degree of an individual's agricultural involvement was measured in this study as the independent variable. To determine their level of involvement in production agriculture and their attitude toward the industry, participants were asked to rate their level of agreement or disagreement (1 = *Strongly disagree*, 5 = *Strongly agree*) on a five-point Likert scale. Participants were prompted to rate the following statements: "I am involved in production agriculture," "I am emotionally connected to the agriculture industry," "I strongly identify with the agriculture industry," "I trust the livestock production industry," "I have concerns about the safety of meat-based food products," and "I believe livestock producers in the U.S. are dedicated to producing safe products." This scale was adapted from a thesis study by Bigham (2017). Tarpley et al. (2017) used this same scale and reported a high reliability coefficient ($\alpha = 0.97$).

Visual attention acted as a dependent variable of the study. A Tobi X2-60 eye tracker was paired with Tobi Studio software (Version 3.4.8) for integration of stimuli and collection of gaze data. This program is noninvasive and does not assert any differences from typical computer use. Points of gaze were sampled at 60 Hz. Each step of the pork production process defined an area of interest (AOI). These regions were drawn around the facilities as well as the text generated when a participant clicked the region to view more. This study also observed fixations, characterized by brief instances of time when the eye is relatively inactive for at least 60 milliseconds. The Tobii I-VT fixation filter algorithm was implemented to process raw gaze data. As a complement to the eye-tracking data, a self-report question asked participants to identify the production process they allocated the most time toward during the website navigation procedure.

Trust was also evaluated as a dependent variable. To assess participants' level of trust in the company after viewing the webpage, individuals were prompted to rate their level of agreement or disagreement (1 = *Strongly Disagree*, 5 = *Strongly Agree*) on a 5-item, 5-point Likert scale. The following statements were rated: "This organization is qualified to provide information from where food is coming from," "This organization can be trusted to provide factual information about where food is coming from," "This organization is concerned with the public's well-being," "This organization is concerned with making profits above all else," and "This organization has something to gain from making this website." This scale was adapted from LaGrande (2018) and yielded a Cronbach's alpha of .96 in that study.

Data Collection

The procedure of eye tracking necessitates participants to first be seated in a stationary chair with their head approximately 12 inches from the computer screen. Once seated, researchers administered a pre-test questionnaire to the participant using Qualtrics, a web-based questionnaire delivery platform. Once they completed the pre-test, participants were informed the eye-tracking hardware needed to be calibrated to properly gauge the accurate assessment of eye movements. Individuals were prompted to follow a moving dot with their eyes as it moved around the perimeter of the screen and fixated on nine points. The calibration process enabled the

software to calculate the angle of the participants' gaze. As the Tobii system records gaze data from the bottom of the monitor, the procedure is noninvasive and conducive to a natural environment. After calibration was complete, the participants were presented with the stimuli and asked to freely navigate the webpage for five minutes. The eye tracker recorded each participants' eye gaze path as well as the length of time spent looking at different aspects of the screen. These eye tracking procedures are regarded as accepted practices by eye-tracking scholars (Duchowski, 2017). Once the participant completed viewing the webpage, we administered another questionnaire to gather reflecting thoughts and characteristics of trustworthiness garnered from their experience with the website.

Data Analysis

We recorded the questionnaire responses using Qualtrics and exported the data to SPSS v. 24. The eye-tracking data were compiled through the Tobi Studio system, exported into Microsoft Excel, then imported into SPSS. To correctly match participant data between the self-report and eye-tracking measures, each individual was assigned a numerical ID. To answer the research questions, this study employed both descriptive and inferential statistics.

To answer research question one regarding the detection of a scanpath pattern, data from the first 15 seconds of participants viewing the website were recorded in the order of AOIs. The Sequential Pattern Mining (SPM) algorithm was implemented to distinguish commonalities in website navigation (Eraslan et al., 2016). SPM pattern detections are useful when seeking to identify repeated structures correlated with visual elements, such as a webpage (Fournier-Viger et al., 2016). Researchers then report patterns or the absence of a pattern.

The fulfillment of research question two was achieved with a two-part approach – an eye-tracking measure and a self-report measure. To determine the salient attributes of the webpage, the site was coded with the Area of Interest (AOI) tool in the Tobii Studio Eye Tracking software. We drew a shape around an aspect of any information or image to select the parts viewed by an individual. Each step of the production process was coded as a separate AOI, rendering 15 distinct areas. The Tobii system also provided data concerning the total time fixated on an AOI as well as the number of fixations occurring within the defined space. By way of a post-stimuli questionnaire, participants identified from a list the production process they allocated the most time toward during the website navigation procedure. Researchers analyzed the self-report question by counting the frequency each pork production step was indicated.

The third research question, which sought to examine differences in visual attention to the website between individuals with high agricultural involvement and low agricultural involvement, was addressed by creating two groups based upon responses to the agricultural involvement scale questions. Participants who scored above the median scale score of 3.27 were placed in the High involvement group and those below the median were in the Low involvement group. An independent samples *t*-test found the 43 participants in the low involvement group (M = 2.4, SD = 1.02) compared to the 31 participants in the high involvement group (M = 3.83, SD = .94) demonstrated a statistically significant difference in agricultural involvement $t(74)= 2.47$, $p = .01$.

Research question four, which posited how trustworthy participants would consider The Maschhoffs organization was ascertained through the self-report measures concerning the trust scale adapted from LaGrande (2018). An independent samples t-test was conducted to determine

of there were significant differences in trust between the High involvement and Low involvement groups.

Results

RQ 1: What scanpath patterns emerge from individuals' initial evaluation of the website?

The first research question sought to identify scanpath patterns emerging from individuals' initial evaluation of the website. The sequential patterning mining algorithm did not render any significant patterns of spacio-temporal visual allocation during the first 15 seconds of participants' website navigation.

RQ 2: What areas of interest do participants attend to in the website?

The second research question sought to identify what production processes participants visually attend to, which was gathered through eye-tracking AOIs and a self-report question. Due to the interactive, multi-page nature of the website, data regarding AOIs was indiscernible for analysis. The self-report measure revealed the production step to which participants reported allocating the most attention. Of the participants, 40.5% said they allocated the most time to the breed-to-wean farm while 15.5% of participants said the gilt developer. Another 15.5% of participants said the packing facility was where they allocated the most time while exploring the website.

RQ 3: Are there differences in visual attention to the website between individuals with high agricultural involvement and low agricultural involvement?

Depicted in Table 1, results from the third research question explicate both groups of high and low involvement participants reported the breed-to-wean facility as the production process they allocated the most amount of time toward during the website navigation procedure. A median (Mdn = 3.27) score was obtained from the agricultural involvement scale. Participants below the median were categorized into low agricultural involvement group, and participants above the median were regarded as individuals in the high agricultural involvement group. This resulted in 58.1% (n = 43) of participants categorized with low agricultural involvement and 41.9% (n = 31) of respondents placed in the group of high agricultural involvement.

Table 1

Dominant Website Area of Attention Based on Participant Self-Reported Data

Production Process	Low Involvement (n = 43)	High Involvement (n = 31)
Breed-to-Wean Facility	41.9%	38.07%
Finishing Facility	14.0%	19.4%
Boar Stud Farm	14.0%	12.9%
Gilt Developer Farm	11.6%	16.1%
Packing Facility	9.3%	9.7%
Grocery Store	4.7%	6.5%
Consumer Home	2.3%	0.0%
Export and Barge	2.3%	0.0%

Note. Percentages report the proportion of participants who deemed each area of the production process as the area where they spent the most amount of time on the website.

RQ 4: How do participants perceive the trustworthiness of The Maschhoffs organization?

To understand trust in The Maschhoffs organization, research question four was addressed by self-report measure using the trust scale adapted from LaGrande (2018). The Maschhoffs organization accumulated an overall mean trust score of 4.0 (*SD* = .85). Therefore, participants overall indicated trust in The Maschhoffs as results closer to "1" indicate less trust and closer to "5" indicate more trust in The Maschoffs. An independent samples t-test found no significant difference in perceived trustworthiness between those with high or low level of agriculture involvement, $t(74) = 1.5$, $p = .08$, despite high involvement participants ($M = 4.50$, $SD = .83$) indicating higher self-reported measures of trust than the low involvement group ($M = 3.80$, $SD = .71$). Participants generally agreed The Maschhoffs was qualified and could be trusted to provide information. Additionally, participants largely agreed The Maschhoffs organization had something to gain from developing the website.

Conclusions/Implications/ Recommendations

Results from this study reflect the individualistic nature of website usage. The absence of a scanpath pattern implies the lack of cohesive repetition, a finding perhaps linked with the request for navigational aid distilled from the open-ended responses. Participants often found themselves confused as to the sequence of the production process, as they each forged a distinct path rather than adhering to any discrete pattern. This aligns with selective attention, which explains people will attend to visuals and information that align with their goals (Smith et al., 2007). If it was the intention of website developers to encourage viewers to follow a specific path, revisions to the website to consolidate areas of interest may need to be considered. Alternatively, if the goal is to allow users to choose their own adventure through the map, then the website supports the individual freedom of the user to find the information of interest to them and allow the user to dig deeper into that subject instead of constraining them to a linear journey through the map. If the website does not prioritize the content for the viewer, their selective attention processes will make those choices for them to guide attention (Gong & Cummins, 2016).

One notable conclusion fostered by the study's findings is the marked interest participants displayed to the breed-to-wean farm. Out of the eight production processes, more than a third of participants reported spending the most time attending to the breed-to-wean farm section of the webpage. Participants in both categories of involvement in agriculture gave attention to this area on the map, which describes the shelters of sows from insemination periods to approximately three weeks after birth. Among the most contentious practices in conventional swine production sensationalized by animal activist groups take place in the breed-to-wean facility. The use of gestation pens, farrowing crates, as well as the tail-docking of piglets occur in this sector of the farm operations. This finding aligns with previous work conducted by Deemer and Loboa (2011), suggesting these pork industry practices are among the most concerning to consumers. The overwhelming amount of information concerning the entire system of commercial pork production can present barriers to agricultural communicators, who may struggle to deliver targeted messaging. The finding that participants invested attention in this area reflects the interest and concern they harbor for this division of production (Smith et al., 2007). Researchers recommend agricultural practitioners exert time and energy in developing communication materials regarding the practices within the breed-to-wean component of the pork production process.

Another area of the website that may benefit from expansion is the slaughtering process. The practices undertaken to harvest the swine did not constitute one of the eight production steps detailed in the website. Previous research has noted the complicated balance of striving to be transparent without providing imagery potentially graphic or distressing to some audiences (Rumble & Irani, 2016; Tarpley et al., 2020). As Rawlins (2008) contended, the threshold of transparency pertains to what the consumer perceives to be adequate information, researchers recommend further research exploring methods of informing consumers, particularly those in Generation Z, about slaughtering practices to increasingly engage in this dialogue.

Results stemming from the trust scale indicate participants believed The Maschhoffs to be a trustworthy source of information and an organization inherently concerned in upholding the public's well-being. However, the overall trust score was higher for participants with high agricultural involvement versus those with lower agricultural involvement, which may be the result of the alignment of the website's information with the personal involvement and goals of the participants (Fischer, 2017; Klink et al., 2014; MacInnis & Jaworksi, 1989; Smith et al., 2007). Previous research has revealed the perceived trustworthiness and knowledge of farmers (Center for Food Integrity, 2018), an insight explicating the innate value created by agricultural organizations and businesses in providing consumers with information regarding production practices. With this is mind, it is important to note consumers also recognize the benefits to the organization derived from building a website, a finding implying agricultural businesses will constantly have to work to build trust with young consumers.

With regards to recommendations for research, future inquiry is needed to qualitatively identify specific concerns and interests Generation Z consumers possess regarding pork production. Such studies would grant refined insight as to which parts of the pork production cycle were most salient to young consumers. Focus groups would allow participants to explain the thoughts, attitudes, and questions they had while viewing the website or when considering the process of pork production. Additionally, inquiries seeking to better understand how much caution agricultural communicators should exercise when relaying information concerning slaughtering practices and other contentious topics could be advantageous to communication strategies.

Instead of using multiple interactive webpages in an eye-tracking study, it is recommended future studies select a smaller subset of webpages to explore. Interactive websites with many pages and changing graphics can be assessed with eye-tracking software for visual attention; however, the data collected are challenging to discern and digest for useful reporting and discussion. Another option is for researchers to use static webpages in their eye-tracking work to create clear, unchanging areas of interest and determine individual page scanpaths from the inquiry (King et al., 2019).

As for agricultural communicators who develop websites, they are encouraged to keep the selective attention of viewers in mind when designing online communication tools. By seeking to create pages harnessing top-down responses by following a streamlined narrative aligning with viewers' motivations, the information presented will be increasingly salient for an audience (Cummins et al., 2016).

References

Akin, H. & Scheufele, D. A. (2017). Overview of the science of science communication. In K. H. Jamison, D. Kahan, & D. A. Scheufele (Eds.), *The Oxford handbook of the science of science communication* (pp. 311–319). Oxford University Press.

Alonso, M. E., González-Montaña, J. R., & Lomillos, J. M. (2020). Consumers' concerns and perceptions of farm animal welfare. *Animals, 10*(3), 385. https://doi.org/10.3390/ani10030385

Amos, N., & Sullivan, R. (2018). *The business of farm animal welfare*. Routledge.

Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 255-291). Lawrence Erlbaum.

Astill, J., Dara, R. A., Campbell, M., Farber, J. M., Fraser, E. D., Sharif, S., & Yada, R. Y. (2019). Transparency in food supply chains: A review of enabling technology solutions. *Trends in Food Science & Technology, 91*, 240-247. https://doi.org/10.1016/j.tifs.2019.07.024

Auger, P., & Devinney, T. M. (2007). Do what consumers say matter? The misalignment of preferences with unconstrained ethical intentions. *Journal of Business Ethics, 76*(4), 361-383. https://doi.org/10.1007/s10551-006-9287-y

Bilyea, T. & McInnes, D. (2018). With natural capital and trust, Canada can become an agrifood powerhouse. *The Global Mail.* https://www.theglobeandmail.com/report-on-business/rob-commentary/with-capital-and-trust-canada-can-become-an-agrifood-powerhouse/article30989002/

Bigham, A. (2017). *The effect of source credibility and gender on message persuasiveness.* [Master's thesis, Texas Tech University]. TTU Electronic Theses and Dissertations. http://hdl.handle.net/2346/73515

Blokhuis, H. J., Keeling, L. J., Gavinelli, A., & Serratosa, J. (2008). Animal welfare's impact on the food chain. *Trends in Food Science & Technology*, 19, S79-S87. https://doi.org/10.1016/j.tifs.2008.09.007

Bucher, H.-J., & Schumacher, P. (2006). The relevance of attention for selecting news content. An eye-tracking study of attention patterns in the reception of print and online media. *Communications, 31*, 347-368. https://doi.org/10.1515/COMMUN.2006.022

Bui, S., Costa, I., De Schutter, O., Dedeurwaerdere, T., Hudon, M., & Feyereisen, M. (2019). Systemic ethics and inclusive governance: two key prerequisites for sustainability transitions of agri-food systems. *Agriculture and Human Values, 36*(2), 277-288. https://doi.org/10.1007/s10460-019-09917-2

Castells, M. (2012). *Networks of outrage and hope: Social movements in the internet age.* Polity.

Castells, M. (2014). *The impact of the internet on society: A global perspective* [Scholarly project]. In *Open Mind*. http://aasa.ut.ee/augsburg/literature/CASTELLS_BBVA-OpenMind-book-Change-19-key-essays-on-how-internet-is-changing-our-lives-Technology-Internet-Innovation.pdf

Center for Food Integrity. (2018). *A dangerous disconnect*: *When consumers hold you responsible but don't trust you*. http://www.foodintegrity.org/wp-content/uploads/2018/01/CFI_Research_8pg_010918_final_web_REV2-1.pdf

Chu, S., Paul, N., & Ruel, L. (2009). Using eye tracking technology to examine effectiveness of design elements on news websites. *Information Design Journal, 17(*1), 31–43. https://doi.org/10.1075/idj.17.1.04chu

Corallo, A., Latino, M. E., Menegoli, M., & Spennato, A. (2019). A survey to discover current food choice behaviors. *Sustainability, 11*(18), 5041. https://doi.org/10.3390/su11185041

Croney, C. C., Apley, M., Capper, J. L., Mench, J. A., & Priest, S. (2012). Bioethics symposium: The ethical food movement: What does it mean for the role of science and scientists in current debates about animal agriculture? *Journal of Animal Science, 90*, 1570-1582.

Cummins, R. G. (2017). Eye tracking. In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *The International Encyclopedia of Communication Research Methods* (pp. 1–8). John Wiley & Sons. https://doi.org/10.1002/9781118901731.iecrm0099

Cummins, R. G., Gong, Z., & Kim, H. S. (2016). Individual differences in selective attention to information graphics in televised sports. *Communication & Sport, 4*(1), 102-120. https://doi.org/10.1177/2167479513517491

Deemer, D. R., & Lobao, L. M. (2011). Public concern with farm-animal welfare: Religion, politics, and human disadvantage in the food sector. *Rural Sociology, 76*(2), 167-196. https://doi.org/10.1111/j.1549-0831.2010.00044.x

Dimock, M. (2019, January 17). Defining generations: Where Millennials end and Generation Z begins. *Pew Research Center*. https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/

Duchowski, A. T. (2017). *Eye tracking methodology* (3rd ed.). Springer.

Eraslan, S., Yesilada, Y., & Harper, S. (2016). Eye tracking scanpath analysis techniques on web pages: A survey, evaluation and comparison. *Journal of Eye Movement Research, 9*(1), 1-19. https://doi.org/10.16910/jemr.9.1.2

Ficko, A., & Bončina, A. (2019). Public attitudes toward environmental protection in the most developed countries: The Environmental Concern Kuznets Curve theory. *Journal of Environmental Management, 231*, 968-981. https://doi.org/10.1016/j.jenvman.2018.10.087

Fischer, L. M. (2017). *Examining the role of motivational salience, issue involvement, and preexisting attitudes on selective attention and attitude strength to advertisements* [Doctoral dissertation, Texas Tech University]. TTU Electronic Theses and Dissertations. http://hdl.handle.net/2346/73213

Fournier-Viger, P., Lin, J. C.-W., Gomariz, A., Gueniche, T., Soltani, A., Deng, Z., & Lam, H. T. (2016). The SPMF open-source data mining library version 2. *Machine Learning and Knowledge Discovery in Databases Lecture Notes in Computer Science*, 36-40. https://doi.org/10.1007/978-3-319-46131-1_8

Fox, J. R., Lang, A., Chung, Y., Lee, S., Schwartz, N., & Potter, D. (2004). Picture this: Effects of graphics on the processing of television news. *Journal of Broadcasting & Electronic Media, 48*, 646-674. https://doi.org/10.1207/s15506878jobem4804_7

Gong, Z. & Cummins, R. G. (2016, August). Processing capacity in visual search: The impact of visual salience and involvement on attention [Paper presentation]. *Annual meeting of the Association for Education in Journalism and Mass Communication*, Minneapolis, MN, United States.

Goodwin, J. N., Chiarelli, C., & Irani, T. (2011). Is perception reality? Improving agricultural messages by discovering how consumers perceive messages. *Journal of Applied Communications, 95*(3), 3. https://doi:10.4148/1051-0834.1162

Goodwin, J. (2013). *Taking down the walls of agriculture: Effect of transparent communication and personal relevance on attitudes and trust within the Elaboration Likelihood Model.* [Doctoral dissertation, University of Florida]. http://ufdcimages.uflib.ufl.edu/UF/E0/04/53/18/00001/GOODWIN_J.pdf

Greussing, E., Kessler, S. H., & Boomgaarden, H. G. (2020). Learning from science news via interactive and animated data visualizations: An investigation combining eye tracking, online survey, and cued retrospective reporting. *Science Communication, 42*(6), 803-828. https://doi.org/10.1177/1075547020962100

Grunert, K. G., Sonntag, W. I., Glanz-Chanos, V., & Forum, S. (2018). Consumer interest in environmental impact, safety, health and animal welfare aspects of modern pig production: Results of a cross-national choice experiment. *Meat Science, 137*, 123-129. https://doi.org/10.1016/j.meatsci.2017.11.022

Ho, C. L. L. (2018). *Website interactivity as structure: How the feature type and quantity affect users' resource allocation, and memory* (Publication No. 10749167) [Doctoral dissertation, University of California, Davis]. ProQuest Theses and Dissertations Global.

Hoppe, R. A. (2016). *America's diverse family farms.* U.S. Department of Agriculture Economic Research Service. https://www.ers.usda.gov/webdocs/publications/81408/eib-164.pdf?v=42709

Itti, L., & Koch, C. (2000). A saliency-based search mechanism for overt and covert shifts of visual attention. *Vision Research, 40* (10-12), 1489-1506. https://doi.org/10.1016/S0042-6989(99)00163-7

Kemper, J. A., & Ballantine, P. W. (2019). What do we mean by sustainability marketing? *Journal of Marketing Management, 35*(3-4), 277-309. https://doi.org/10.1080/0267257X.2019.1573845

Kim, S., & Rader, S. (2010). What they can do versus how much they care: Assessing corporate communication strategies of Fortune 500 websites. *Journal of Communication Management, 14*(1), 59-80. https://doi.org/10.1108/13632541011017816

King, A. J., Bol, N., Cummins, R. G., & John, K. K. (2019). Improving visual behavior research in communication science: An overview, review, and reporting recommendations for using eye-tracking methods. *Communication Methods and Measures, 13*(3), 149-177. https://doi.org/10.1080/19312458.2018.1558194

Klink, P. C., Jengtgens, P., & Lorteije, J. A. (2014). Priority maps explain the role of value, attention, and salience in goal-oriented behavior. *Journal of Neuroscience, 34*(42), 13867-13869. https://www.doi.org/10.1523/JNEUROSCI.3249-14.2014

Lamine, C., Renting, H., Rossi, A., Wiskerke, J. S. C. & Brunori, G. (2012). Agri-food systems and territorial development: innovations, new dynamics and changing governance mechanisms. In I. Darnhofer, D. Gibbon, & B. Dedieu (Eds.), *Farming systems research into the 21st century: The new dynamic* (pp. 229-256). Springer.

Lang, A., Chung, Y., Lee, S., Schwartz, N., & Shin, M. (2005). It's an arousing, fast-paced kind of world: The effects of age and sensation seeking on the information processing of substance abuse PSAs. *Media Psychology, 7*, 421-454. https://doi.org/10.1207/S1532785XMEP0704_6

LaGrande, L. (2018). *Trust in agricultural messages: A moment to moment analysis.* [Master's thesis, Texas Tech University]. TTU Electronic Theses and Dissertations. https://ttu-ir.tdl.org/handle/2346/82673

Leal, A., Ruth, T. K., Rumble, J. N., & Simonne, A. H. (2017). Exploring Florida residents' food safety knowledge and behaviors: A generational comparison. *Food Control, 73*, 1195-1202. https://doi.org/10.1016/j.foodcont.2016.10.040

Ling, E. K., & Wahab, S. N. (2020). Integrity of food supply chain: going beyond food safety and food quality. *International Journal of Productivity and Quality Management, 29*(2), 216-232. https://doi.org/10.1504/IJPQM.2020.105963

Lucas, J. W. (2003). Theory-testing, generalization, and the problem of external validity. *Sociological Theory, 21*(3), 236-253. https://doi.org/10.1111/1467-9558.00187

MacInnis, D. J. & Jaworksi, B. J. (1989). Information processing from advertisements: Toward an integrative framework. *Journal of Marketing, 53*(4), 1-23. https://www.doi.org/10.2307/1251376.

Mancini, M. C., & Antonioli, F. (2020). To what extent are consumers' perception and acceptance of alternative meat production systems affected by information? The case of cultured Meat. *Animals, 10*(4), 656. https://doi.org/10.3390/ani10040656

Morris, O., Miller, J. D., & Whitehead, I. (2019). A Website Content Analysis of Corporate Animal Welfare Messaging. *Journal of Applied Communications, 103*(4). https://doi.org/10.4148/1051-0834.2268

Nardi, V. A. M., Jardim, W. C., Ladeira, W., & Santini, F. (2019). Predicting food choice: A meta-analysis based on the theory of planned behavior. *British Food Journal, 121*(10), 2250-2264. https://www.doi.org/10.1108/BFJ-08-2018-0504

Napolitano, F., Girolami, A., & Braghieri, A. (2010). Consumer liking and willingness to pay for high welfare animal-based products. *Trends in Food Science & Technology*, *21*(11), 537–543. https://doi.org/10.1016/j.tifs.2010.07.012

Perez-Cueto, F. J. (2019). An umbrella review of systematic reviews on food choice and nutrition published between 2017 and-2019. *Nutrients, 11*(10), 2398. https://doi.org/10.3390/nu11102398

Pieters, R., & Wedel, M. (2004). Attention capture and transfer in advertising: Brand, pictorial, and text-size effects. *Journal of Marketing, 68*, 36–50. https://doi.org/10.1509/jmkg.68.2.36.27794

Pribis, P., Pencak, R. C., & Grajales, T. (2010, May). Beliefs and attitudes toward vegetarian lifestyle across generations. *Nutrients, 2*(5), 523–531. https://doi.org/10.3390/nu2050523

Rawlins, B. (2008). Measuring the relationship between organizational transparency and employee trust. *Public Relations Journal, 2(*2), 1-21. https://prjournal.instituteforpr.org/wp-content/uploads/Measuring-the-relationship.pdf

Robinson, C. R., Ruth, T. K., Easterly III, R. G., Franzoy, F., & Lillywhite, J. (2020). Examining consumers' trust in the food supply chain. *Journal of Applied Communications, 104*(2), 5. https://doi.org/10.4148/1051-0834.2298

Rothman, D. (2014). A tsunami of learners called Generation Z. *British Journal of Psychiatry, 205*(01), 76–77. https://doi.org/10.1192/bjp.205.1.76a

Rumble, J. N. & Irani, T. (2016). Opening the doors to agriculture: The effect of transparent communication on attitude. *Journal of Applied Communications, 100*(2), 57-72. https://doi.org/10.4148/1051-0834.1030

Seemiller, C., & Grace, M. (2016). *Generation Z goes to college*. John Wiley & Sons.

Smith, S. M., Fabrigar, L. R., Powell, D. M., & Estrada, M. J. (2007). The role of information-processing capacity and goals in attitude-congruent selective exposure effects. *Personality and Social Psychology Bulletin, 33*(7), 948-960. https://doi.org/10.1177/0146167207301012

Specht, A. R., McKim, B. R., & Rutherford, T. (2014). A little learning is dangerous: the influence of agricultural literacy and experience on young people's perceptions of

agricultural imagery. *Journal of Applied Communications, 98*(3), 63-74. https://doi.org/10.4148/1051-0834.1086

Stanton, C., & Fischer, L. (2020). Let's focus in: A guide to eye tracking technology in agricultural communications research. *Journal of Applied Communications, 104*(2). https://doi.org/10.4148/1051-0834.2320

Strong, C. (1996). Features contributing to the growth of ethical consumerism - a preliminary investigation. *Marketing Intelligence & Planning,14*(5), 5-13. https://doi.org/10.1108/02634509610127518

Symonenko, S. (2007). Websites through genre lenses: Recognizing emergent regularities in websites' content structure (ProQuest ID: 304781774) [Doctoral dissertation, Syracuse University]. https://surface.syr.edu/it_etd/15

Tarpley, T. G., Bigham, A. L., Steede, G. M., & Akers, C. L. (2017). *Who even cares about agriculture? An instrument for measuring agricultural involvement* [Research poster]. Annual Meeting of the Association for Communication Excellence, New Orleans, LA.

Tarpley, T. G., Fischer, L. M., Steede, G. M., Cummins, R. G., & McCord, A. (2020). How much transparency is too much? A moment-to-moment analysis of viewer comfort in response to animal slaughter videos. *Journal of Applied Communications, 104*(2). https://doi.org/10.4148/1051-0834.2302

The Maschhoffs. (n.d.). History. http://www.themaschhoffs.com/our-family/history

Wandel, M. (1994). Understanding consumer concern about food-related health risks. *British Food Journal*, *96*(7), 35–40. https://doi.org/10.1108/00070709410076342

Wang, C., Van Fleet, D. D., & Mishra, A. K. (2017). Food integrity: A market-based solution. *British Food Journal, 119*(1), 7-19. https://www.doi.org/10.1108/BFJ-04-2016-0144

Wiskerke, J. S. C. (2009). On places lost and places regained: Reflections on the alternative food geography and sustainable regional development. *International Planning Studies, 14*(4), 369-387. https://doi.org/10.1080/13563471003642803

Wognum, P. N., Bremmers, H., Trienekens, J. H., van der Vorst, J. G., & Bloemhof, J. M. (2011). Systems for sustainability and transparency of food supply chains–Current status and challenges. *Advanced Engineering Informatics, 25*(1), 65-76. https://doi.org/10.1016/j.aei.2010.06.001

Xu, Q., & Sundar, S. S. (2016). Interactivity and memory: Information processing of interactive versus non-interactive content. *Computers in Human Behavior, 63*, 620-629. https://doi.org/10.1016/j.chb.2016.05.046